

What is claimed is:

1 1. A method for generating multiple high-resolution pulse width
2 modulated (PWM) signals comprising the steps of:
3 receiving data representative of duty cycle values;
4 sorting said duty cycle values in a duty cycle table to generate a PWM
5 generation table;
6 generating an interrupt from a capture and compare interrupt defined
7 by a match between a timer value and a duty cycle register;
8 generating an interrupt from a timer overflow;
9 generating multiple PWM signals as defined by said PWM generation
10 table upon detection of said capture and compare interrupt; and
11 returning to a beginning point in said PWM generation table upon
12 generation of a timer overflow interrupt.

1 2. The method as claimed in claim 1 wherein said step of sorting
2 said duty cycle values further comprises the steps of:
3 sorting said duty cycle values along with data stored in a port table
4 containing port pin assignments for each duty cycle value; and
5 sorting said duty cycle values along with data stored in a bit-mask table
6 containing bit-mask assignments corresponding to a specific port pin
7 assignment.

1 3. The method as claimed in claim 1 wherein said step of sorting
2 said duty cycle values to generate a PWM generation table further comprises
3 the step of placing an invalid duty cycle value at the end of the PWM
4 generation table, wherein said invalid duty cycle value is a value that is not
5 equal to said timer value for allowing the timer to overflow.

1 4. The method as claimed in claim 1 wherein said step of
2 generating an interrupt further comprises the step of writing values to a
3 plurality of port pins directly from said PWM generation table.

1 5. The method as claimed in claim 1 wherein said step of sorting
2 said duty cycle values is done in a background task.

1 6. The method as claimed in claim 1 wherein said step of
2 generating an interrupt from a timer overflow further comprises the step of
3 resetting a plurality of port pins to low.

1 7. A system for generating multiple high-resolution pulse width
2 modulated (PWM) signals comprising:
3 a microprocessor having a timer, said microprocessor for receiving
4 duty cycle values;
5 a communication bus for sending duty cycle values to said
6 microprocessor;
7 a capture and compare module in communication with said
8 microprocessor;
9 a duty cycle table at a predetermined location in memory of said
10 microprocessor, said duty cycle table for storing said duty cycle values;
11 a port table having port assignments corresponding to a duty cycle
12 value in said duty cycle table, said port table being stored in memory of said
13 microprocessor;
14 a bit-mask table having bit-mask assignments corresponding to a port
15 assignment in said port table, said bit-mask table being stored in memory of
16 said microprocessor;
17 a PWM generation table created by sorting said duty cycle table, said
18 port table and said bit-mask table upon receipt of all duty cycle values; and
19 an interrupt routine that is entered only upon generation of an interrupt
20 wherein said interrupt routine allows said microprocessor to write a
21 predetermined duty cycle value from said PWM generation table to a
22 predetermined port assignment from said PWM generation table.

1 8. The system as claimed in claim 7 wherein said interrupt is
2 generated by a match between a value of said timer and a duty cycle value;
3 and

4 said predetermined values are written to said port assignment from said
5 PWM generation table.

1 9. The system as claimed in claim 7 wherein said interrupt is
2 generated by a timer overflow and said predetermined values for said port
3 assignments are all low.

1 10. A method for generating multiple high-resolution pulse width
2 modulated (PWM) signals in a system having a microprocessor, a
3 communication bus, and a timer, said method comprising the steps of:
4 receiving a plurality of duty cycle values at said microprocessor;
5 placing said duty cycle values in a duty cycle table wherein each duty
6 cycle value has a corresponding port assignment in a port table and a
7 corresponding bit-mask assignment in a bit-mask table, said port and bit-mask
8 tables being embedded in software in said microprocessor;
9 generating a PWM generation table by sorting said duty cycle, port and
10 bit-mask tables in a background task of said microprocessor;
11 generating a capture and compare interrupt when a source of said
12 interrupt is when a timer value matches a duty cycle value;
13 generating a timer overflow interrupt when a source of said interrupt is
14 an overflow of said timer;
15 receiving an interrupt at said microprocessor;
16 determining a source for said received interrupt;
17 writing predetermined values to a plurality of pins on said
18 microprocessor based on said source for said interrupt;
19 writing values to a plurality of ports wherein said values are taken
20 directly from said PWM generation table during a capture and compare
21 interrupt;

22 writing a low value to a plurality of pins during a timer overflow
23 interrupt; and
24 returning to a beginning point in said PWM generation table upon
25 generation of a timer overflow interrupt.

1 11. The method as claimed in claim 10 wherein said step of
2 generating a PWM generation table further comprises placing an invalid duty
3 cycle value at the end of said PWM generation table, said invalid duty cycle
4 value being a value that can never be equal to a value of said timer.

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